

Name: \_\_\_\_\_

Date: \_\_\_\_\_

## **Study Guide - Newton's Laws and Forces Quiz**

*Physical Science and Technology*

Instructions: You may write on this handout. Make sure to put your full name in the upper right-hand corner along with today's date. Show the Five Steps where indicated.

*Multiple Choice (you do not need to show your work; simply write the letter of the correct answer)*

1. The net force needed to accelerate an object is calculated by:
  - a. dividing mass by acceleration
  - b. dividing mass by velocity
  - c. multiplying mass by acceleration
  - d. multiplying mass by velocity
  
2. How much force would it take to accelerate a car with a mass of 500 kg car at a rate of 15 m/s/s?
  - a. 0.03 N
  - b. 500 N
  - c. 7500 N
  - d. 33.333 N
  
3. A force is:
  - a. A push
  - b. A pull
  - c. Something that can cause acceleration
  - d. All of the above
  
4. The units for force are:
  - a. Newtons
  - b. m/s/s
  - c. kg
  - d. All of the above
  
5. When I drive my car, my foot pushes on the gas pedal. According to Newton's Third Law, what also must be happening?
  - a. The car is speeding up
  - b. The gas pedal pushes on my foot
  - c. Gasoline flows into the engine
  - d. My leg pushes on my foot
  
6. If you know an object's mass and the force used to push it, you can find the acceleration of the object using the following formula:
  - a. acceleration = mass x force
  - b. acceleration = mass ÷ force
  - c. acceleration = force ÷ mass
  - d. acceleration = mass + force
  
7. According to Newton's First Law, it takes an unbalanced force to:
  - a. speed an object up
  - b. slow an object down
  - c. change an object's direction
  - d. All of the above

Name: \_\_\_\_\_

Date: \_\_\_\_\_

*Problems (answer on a separate sheet of paper):*

1. Renee Maughan is standing on top of a train that is travelling at 7 km/sec. The train hits a cow and comes to a complete stop. There is no gravity or friction in Renee's world. What happens to Renee?
2. Randy Harmsen is using a cattle prod to push on Mr. Bregar's nose. What, according to Newton's Third Law, must also be happening?
3. A carnivorous giraffe throws Mr. Bregar straight up in the air in a location where there **is no gravity**. What happens to Mr. Bregar and why?
4. Wesley Winningham is using his hands to hold Mr. Bregar in the air above his head. Mr. Bregar is not moving. Mr. Bregar is standing on Wesley's hands. What, according to Newton's Third Law, must also be happening?
5. How much unbalanced force would it take to accelerate Penelope Luna at a rate of  $7.6 \text{ m/s}^2$  if Penelope has a mass of 58 kg? Please show the Five Steps.
6. How much mass does Andrew Krivoshein have if it takes 269.3 N of unbalanced force to accelerate him at  $8.883 \text{ m/s}^2$ ? Please show the Five Steps.
7. What would the acceleration of Mr. Bregar be if he has a mass of 65 kg and he is being dragged behind a truck with a net force of 329 N? Please show the Five Steps.